Acta Clinica Bélgica
International Journal of Clinical and Laboratory Medicine

IN MEMORIAM: ANDRE GRATIA

MAURICE WELSCH

It is with heavy astonishment that was greeted the news of the unexpected death of Andre Gratia, first in the heart of the University (of Liege) then in the city of Liege and the whole country (Belgium), and finally in the foreign scientific community. His collaborators and his friends knew that overworked and exhausted he had left Belgium to take some weeks of rest in Switzerland. However, nothing indicated the serious deterioration in his health. Nothing predicted a sudden and brutal end. Barely after having arrived at Nyon, he succombed abruptly, a victim of blind fate, on October 6, 1950.

Andre Gratia was born in Saint-Gilles, Belgium, on July 8, 1893. After brilliant middle school studies at the Athenee Communal, Gratia becomes a student at the University of Bruxelles. He commences his medicine studies in 1910, and very soon he is spending time at the university research laboratories. In 1913, when he is barely 20 years old, he publishes his first publications. These studies and publications were to be interrupted by the First World War in 1914-1918. During the war, Andre Gratia valiantly does his duty as an auxiliary doctor. He earns the Croix de Guerre (War Cross medal) and 8 front line Chevrons.

Once the torments of war over, Gratia returns to his studies. He is named Doctor of Medicine with the highest distinction in 1919, later special doctor in Physiology Sciences in 1920.

Gratia continues his researches abroad: Institut Pasteur of Paris (1920), then Rockefeller Institut for Medical Research in New York (1920-1921). Subsequently, he returns to the Service de Bacteriologie at the Faculty of Medicine, University Libre de Bruxelles, as Director of Research, then earns his Agrege designation which enables him to work with the Master microbiologist, Jules Bordet.

In 1932 the University of Liege Faculty of Medicine calls on him to become Chair of Bacteriology, as an external, special faculty member. The following year, the

Royal Academy of Rome, then the Royal Academy of Medicine of Belgium name him as an External Member. In 1934 he is promoted to the rank of regular teacher. In the same year the Permanent Deputation of Liege entrusts him with the Direction of the Bacteriology Service in its Provincial Institute, founded by Ernest Malvoz.

Once more war comes to interrupt, or diminish, his scientifique activity, as well as the activity of the school which he founded. Gratia is again a patriot. The Resistance is honoured that he is among their members. (See also Gestapo visit story)

Immediately after Liberation, Gratia's pioneering role in the realm of antibiose, which had taken on greater importance due to its medical applications, is finally recognized. Following the initiative of the Ministre of Public Health, the Government decides to create a Penicillin and other Antibioses Research Center. The previous research done by Gratia naturally designates him as the logical choice to organize this center and to lead its destiny. In spite of the many difficulties Gratia anticipated, and in spite of the great amount of work that this mission would cause him, Gratia does not hesitate to accept the position, desiring above all to endow his country and his University with the modern research ressources to instigate a surge in research in all domains of theoretical and applied microbiology. He thus becomes the President of the Directing Committee of the Center.

The academic prizes, honors and distinctions Gratia receives during his fertile career as Master are beyond count (see 1949 Nobel prize nomination). This would include illustrious learned societies of Belgium and other countries, who considered it an honour to count him among their members.

Gratia's scientific publications are remarkable by their abundance — about two hundred — and by their quality.

I would not be able to do them justice in a few sentences. I can only briefly sketch them:

His first publications deal with the exciting subject of blood coagulation. He discovers, then studies in greater detail, the coagulating activity of the Staphylococcus through their main activating agent, Staphylocoagulase (1919).

These research bring him to develop greater interest in microorganisms. The physiologist becomes the microbiologist and elects bacteriophagie as his research focus. Gratia isolates the first bacteriophage of the Staphylococcus. (1921). By multiplying his ingenious experiments, he contributes, in an essential manner, to establish the concepts of bacteriophage autonomy and plurality. He successfully, victoriously demonstrates, after a resounding polémique, the identity of the phenomenas of Twort and Herelle. (Bacteriophages used for therapeutical reasons)

During his researches he elaborates a simple, elegant, numerical system for bacteriophages. This system is worldwide used today, without, unfortunately, having Gratia's name attached to it. (1936)

Using the concept of his Master, Jules Bordet, according to which a bacteriophage is the product of a microbiological cell, a type of fermentation, Gratia modifies his interpretations. He soon defends the theory, which states that bacteriophages are exogenic infecting particles, viruses, agents causing a particular disease in susceptible sensitive microbes. The study of plant and insect viruses which Gratia undertakes using his serological methods and ultracentrifugation (1936) brings to light that, indeed, there exist striking analogies between them and bacteriophages.

His last researches (1950) were dedicated to the study of the relationship between bacteriophages and certain antibiotics, the colicines.

From his main straightforward and robust research source, many research branches and twigs detached and grew. During his research on bacteriophages, Gratia had observed many diverse phenomenas. With a remarkable certainty of judgment, he foresaw the importance of certain among them. He had started to research these various diverse phenomena, until the principal problems of bacteriophages imperiously called for his return. Thus, he entrusted to his many disciples the continuation to research the diverse phenomenas he had seen.

This is how as a sideline to his investigations on the bacteriophage he accidentally finds in1923 the destructive activity that Staphylococcus submit to the cadavers of their siblings, which he names the 'Staphyoloccic isophagy'. He

meritoriously derives from this fortuitous observation, which was the result of a fortuitous technical error, a brand new idea: Microorganisms inter-destroy each other continually in Nature. Even more meritoriously, Gratia has the notion to continue his research to prove his assertion.

Thus, he finds the intense bacteriophages power of certain microbes, the Actinomycetes, and others. (1924). Having demonstrated the considerable role of antibiotics in nature, Gratia endeavours the possibility of using these as therapeutic agents and endows medicine with a new type of vaccine (mycolysat), which is remarkable by its high efficiency and absence of toxicity. Later these Actinomycetes would become the source of a series of highly therapeutic substances, such as Streptomycine, chloromycetine, aureomycine, terramucine.

But antibiotic activity is not the appanage of certain bacteria. Gratia also observes this activity in lower level mushrooms. He isolates a *Penicillium*, poorly identified by the epithet *glaucum,* capable of rapidly destroying the cells of the Anthrax bacillus. This is thanks to the production of a diffusible substance which was very actively antibacterial. This substance could have been penicillin itself. We are only in 1924!

Again, while studying the problems of bacteriophagie, Gratia observes the action of an inhibition layer of a certain strain of the Colo bacillus (colon bacteria) on other strains of the same species, one of the most striking example of isoantagonism known. This will be the starting point for multiple researches which will culminate in the discovery of a new class of antibiotics, the colicines.

Several immunology problems have also retained the attention of Gratia. Herein named are his studies on local immunity, allergy to catgut, the importance of which is well-known by surgeons, on the phenomena of Sanarelli-Schwartzman.

I cannot omnicite everything about Gratia. I would like to again to evoke that Gratia after being the ‘Savant’, was also the ‘Teacher' in front of his students, and the ‘Boss’ in his laboratory.

Eloquent and enthusiastic, Andre Gratia gave lectures that one followed with ever-increasing interest. His brilliant exposes, the depth of which were always moderated by a touch of humour, easily retained the attention of his audience.

He believed in the virtue of teaching by example. He particularly demonstrated this during the saga of the discovery of bacteriophagie. Gratia was aware of ever-increasing research burdens of his students. He cared greatly about their fate and tried to lighten their burdens to the greatest extent he could.

In the most intimate circle of his laboratory research colleagues, he was the ideal 'Boss'. He had all of the required Boss qualities: manual dexterity, technical ingenuity, experimental rigor, constructive imagination, communicative enthusiasm, capacity to attract curious young people around himself who were eager to taste research work.

He also had the qualities to keep them around himself: benevolence and interest in their research progress and in their physical well being. Finally, he knew how to publicly recognize the particular merits of his most ancient disciples. He did not hesitate to graciously self-erase himself in front of the special competences they had acquired.

Andre Gratia was by far not one of those Geniuses for whom nothing exists outside their laboratory. Voracious reader, he was interested in the arts, especially painting, and he liked music. He was a great friend of Nature. Born as a Bruxellois by birth, he became a Liegeois by adoption. He liked to walk in the the Valley of Ourthe in the Ardennes and to tell his visiting foreign colleagues about them (beauty).

Bacteriology has lost in him, a Genius, whose work is everlasting. The University and the Faculty of Medicine regret a prestigious Professor whose authority was undisputed. His students cry a Master whose kindness was without limits. He close collaborators feel with painful acuity the immense vacuum caused by his departure.

May his family, so brutally tested, today receive the moving expression of our sincere condolences. With them we cry and we suffer. With them as well, we have the supreme consolation to have legitimate pride, knowing that a Genius and a Man, as was Andre Gratia, can never fully depart. His immortal work will outlive him. The Spirit, the Flamme which animated him remains alive in each of the hearts of those who knew, venerated, loved him.

October 1950. Maurice Welsch,